

IDENTITY OF *CROCODILUS MEXICANUS* BOCOURT, 1869 (REPTILIA: CROCODYLIDAE)

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Abstract.—Examination of type material and analysis of Central American crocodile neck squamation indicate that *Crocodylus mexicanus* is a synonym of *Crocodylus moreletii*.

Crocodylus mexicanus Bocourt, 1869 was recognized for less than twenty years (Sumichrast 1880, 1882, 1884; Cope 1887, as a subspecies of *C. americanus*) until Günther (1885) synonymized it with *Crocodylus moreletii* Duméril and Bibron, 1851 (as *C. americanus* var. *moreletii*). In 1889 Boulenger transferred *C. mexicanus* to the synonymy of *Crocodylus americanus* Laurenti, 1768 (= *Crocodylus acutus* Cuvier, 1807) as suggested by Gray (1872). Since Boulenger's action, the specific allocation of this taxon has been uncertain and most subsequent authors have merely followed Boulenger uncritically.

Crocodylus mexicanus was described from two specimens: an adult received at the Muséum National d'Histoire Naturelle, Paris (MNHN 7579), from Tampico in 1845 and referred to as "variété à dix écussons cervicaux" of *C. acutus* by Duméril and Duméril (1851), and Duméril (1852); along with a juvenile.

Crocodylus mexicanus was said to differ from *C. acutus* by head shape, color, and neck squamation, but was not compared to *C. moreletii*. The figure of the adult syntype (Bocourt 1873, pl. 8, fig. 3) showed a large crocodile with ten neck shield or nuchal scales, and dark coloration. This plate also showed regular tail squamation, and a distinct preorbital hump, two character states associated with *C. acutus*.

Analysis of the number of neck scales in

C. acutus and *C. moreletii*, based on museum specimens and material examined in Mexico and Central America, and a re-examination of MNHN 7579, the adult syntype of *C. mexicanus*, now permit a more definitive specific allocation of this taxon and confirms Smith and Smith's (1977) tentative allocation of *C. mexicanus* to the synonymy of *C. moreletii*.

Analysis of variation in neck squamation used data from 170 crocodiles from Mexico and Central America north of Panama. Our criteria for distinguishing between *C. acutus* and *C. moreletii* are many, but most are subtle and some vary individually. Two reliable characters were found: the presence or absence of basicaudal scale row irregularity (Ross and Ross 1974), and the shape of the premaxillary-maxillary suture (Schmidt 1924). These characters are used by us to identify this sample as containing 70 *C. acutus*, and 100 *C. moreletii* (as shown in Table 1).

Nape scales (PC 25 + 26; terminology of Ross and Mayer 1983 = post-occipital scales of Deraniyagala 1939; King and Brazaitis 1971; Brazaitis 1974; Ross and Roberts 1979) and neck shield scales (PC 20 + 21, 22 + 23 and rarely PC 19 and 24 = nuchal scales as above) were counted. The most common condition in both *C. acutus* and *C. moreletii* is 4 nape scales (60% *C. acutus*, 64% *C. moreletii*) and 6 neck shield scales (60% *C. acutus*, 85% *C. moreletii*). How-

Table 1.—Frequency distribution of number of neck scales in crocodiles from Mexico and Central America north of Panama. Analysis of neck shield scales and nape scutes utilized data from 70 *C. acutus*, and 98 (neck shield) and 100 (nape scutes) *C. moreletii*. Neck shield, Chi square = 38.99, 5 d.f., $P < 0.01$. Nape scutes, Chi square = 63.81, 5 d.f., $P < 0.01$.

| Neck shield (PC 19-24) | Number of scales | | | | | |
|------------------------|------------------|----|---|----|---|---|
| | 3 | 4 | 5 | 6 | 7 | 8 |
| <i>C. acutus</i> | 4 | 18 | 4 | 43 | 1 | 0 |
| <i>C. moreletii</i> | 0 | 1 | 1 | 87 | 5 | 4 |

| Nape scutes (PC 25-26) | 2 | 3 | 4 | 5 | 6 | 7 |
|------------------------|------------------|----|----|----|----|---|
| | <i>C. acutus</i> | 13 | 14 | 43 | 0 | 0 |
| <i>C. moreletii</i> | 0 | 0 | 64 | 15 | 20 | 1 |

ever, the distribution of these traits is significant and helps to distinguish *C. acutus* (fewer neck scales) from *C. moreletii* (Table 1). Only one *C. acutus* (FMNH 23147 from Isla Cozumel, Mexico), had more than 6 neck shield scales and two *C. moreletii* (FMNH 123668 and MCZ 8047 from northeastern Mexico and Quintana Roo, Mexico, respectively) had less than 4 nape scales or 6 neck shield scales.

A discriminant analysis (BMDP7M; Dixon 1975) of these data was performed. The adult syntype of *C. mexicanus*, MNHN 7579, which has 4 nape and 10 neck shield scales, was entered without species identity. It was assigned to *C. moreletii* with a 99% probability.

Examination of MNHN 7579 showed that this specimen also exhibits basicaudal scale row irregularity, a distinctive characteristic of *C. moreletii* (Ross and Ross 1974). This characteristic was not mentioned in the original description, or later redescription, and the figure of MNHN 7579 (Bocourt 1873, pl. 8, fig. 3), which is accurate in most details, was inaccurate for this trait as it clearly shows regular basicaudal scale rows, a condition found in *C. acutus* in Mexico and Central America (Ross and Ross 1974).

The juvenile syntype of *C. mexicanus* has not been located. Bocourt (1869) stated that it originated in the same locality as the adult, i.e., Tampico, but later (1873) gave the locality only as "Mexique." Bocourt (1869) described this specimen, the juvenile syntype, as being no larger than 79 cm and possessing 8 neck shield scales. Owing to the number of neck shield scales it is likely to be referable to *C. moreletii* for the reason outlined above. Because the juvenile is missing, has questionable locality data, and since the nature of its basicaudal tail squamation and shape of the premaxillary-maxillary suture cannot be determined, we designate MNHN 7579, the mounted, ca. 2 m long adult, as lectotype of *C. mexicanus*.

Crocodylus mexicanus Bocourt, 1869

- Crocodylus mexicanus* Bocourt, 1869:20, 1873:34.—Sumichrast, 1880:171, 1882:276, 1884:34.
Crocodylus americanus var. *moreletii* (part.): Günther, 1885:21.
Crocodylus americanus mexicanus: Cope, 1887:20.
Crocodylus americanus (part.): Boulenger, 1889:281.—Cope, 1900:173.
Crocodylus moreletii (part.): Schmidt, 1924:84.—Smith and Smith, 1977:95.
Champsia acuta (part.): Werner, 1933:17.
Crocodylus acutus acutus (part.): Smith and Taylor, 1950:211.
Crocodylus acutus (part.): Wermuth, 1953:476.—Mertens and Wermuth, 1955:408.—Wermuth and Mertens, 1961:359, 1977:141.—Steel, 1973:62.—Alvarez del Toro, 1974:13.—Smith and Smith, 1976:Cr-10.

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